



# FOOD SECURITY, GREEN REVOLUTION AND CANCER

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## ABSTRACT

'It is important to harness all the tools that traditional wisdom and contemporary science can offer in order to usher in an era of bio happiness. The first requirement for bio happiness is nutrition and water security for all and forever'

(M.S. SWAMINATHAN)

About almost five decades after the Green Revolution that helped India to produce food in sufficient levels but has not led to obtain food security completely. A rise in agricultural production does not necessarily translate into food security until it also secures the health of a person. This exploitative farming in India has been doing intensive cultivation on land without conservation of soil fertility and soil structure that would ultimately lead to the springing of deserts. Irrigation without arrangements for drainage resulted in soils getting alkaline or saline.

Indiscriminate use of pesticides and herbicides not only caused adverse change in biological balances but also led to an increase in the incidences of cancer and other diseases through the toxic residues present in the grains or other edible parts.

Therefore this exploitive farming without a proper understanding it's consequences and without building up a proper scientific and training base to sustain it may only lead up in the long run, into an era of agricultural disaster instead of agriculture prosperity and food security.

**KEY WORDS:** Food Security, Cancer, Sustainable Development.

## INTRODUCTION:

After Independence India has to face several challenges to meet the requirements even to meet the basic needs of the country. Adequate food supply was one among the basic problems of Indian Economy. Food security became the priority when there were several incidences of famines in the country. Obtaining food security also serves to achieve the Millennium Development Goals. The current problem of food security in India is of the nature that it's not the lack of nutrient – rich food alone, but rather a weakness in the food supply chain. High prices for the consumer, as well as limited quantity and quality, all resulting from supply chain inefficiency, are sustaining increased malnutrition amongst the poor population.

Food security implies access by all people at all times to sufficient quantities of food to lead an active and healthy life. Food Security has three major dimensions:

1. Availability of food – a function of production.
2. Access to food – a function of purchasing power / access to sustainable livelihood.
3. Absorption of food in the body – determined by access to safe drinking water and non food factors such as environmental hygiene, primary health care and primary education.

Therefore the above mentioned definition of food security not only refers to adequate supply of food with purchasing power but also emphasizes on the absorption of food to lead an active and healthy life.

## OBJECTIVE:

The objective of this paper is to explain and recognize the importance of Food security not only in ensuring adequate food supply but also as ensuring an active and healthy life.

To assure the food security in the country, Green revolution was initiated in late 60's in India. The term green revolution is coined by William Gaud in October 1968, is a process that leads to improves agricultural productivity. Under the leadership of Dr. Norman Borlaug, a variety of high yielding variety of seeds, semi dwarf wheat was bred in late 1960's in India after a severe famine in East India State of Mizoram which affected around 700,000 people.

After using these HYV seeds in India the country's annual wheat production rocketed from 10 million tons in 2008, raising food production rate in excess of population growth, ensuring the first condition of food security.

By the 1990's almost 75 % of agricultural land in India had been sown with HYV rice and wheat varieties, replacing traditional farming practices in many areas and leading to a substantial increase in food production. The first wave of Green

revolution that started in mid 60's till almost a decade was restricted to the limited crop wheat and limited area i.e the western part of India that constitutes of Punjab, Haryana, and western parts of Uttar Pradesh. After a success story already written for a decade the second wave of green revolution was started in India with almost all the crops and including the rest of the country especially the north, east and southern India from 1979-90. The first wave of green revolution worked for the objective of obtaining self sufficiency in food grains while the second wave of green revolution that actually used the staple food 'rice' made it more popular among poor masses and it actually targeted to generate employment and alleviate poverty from India.

The green revolution which entails the application of scientific principles such as HYV's, synthetic fertilizers and chemical insecticides to agriculture so as to improve yields was successful on a vast scale.

This not only helped our country in obtaining food security and moving one step closer to achieve the Millennium Development Goal. It also aims in eradicating extreme poverty and hunger. Therefore Green Revolution helped in saving billions of people from starvation and ensuring food security in the country. It implies the development of HYV of cereal grains, expansion of irrigation infrastructure, modernization of management techniques, distribution of hybridized seeds, synthetic fertilizers and pesticides to farmers.

It helped to overcome famine crisis and enable the country to provide enough food to feed its citizen. However the revolution involved moving away from natural pesticides and conventional grains and towards chemical pesticides, hybrid seeds and later on GM seeds. A promised agricultural output demand increase in some Indian states with national wheat production increasing from 10 million tons in 1960's to almost 95 million tons in 2012. However the green revolution is largely criticized for not tackling the root causes of hunger, indeed these gains came at a price paid by ill health and environment.

The use of GM crops has intensified the situation of water scarcity in the region, as the high intensity nature of the crops require increasing amounts of water over-time, leading to desperate farmers to dig deeper and deeper underground in search of water. Farming with GM crops also led to a reduction in the genetic diversity amongst crops, which in turn led to crops being more susceptible to pests and diseases. It has also led to an increased use of pesticides, this is mainly due to the crop itself becoming increasingly vulnerable to disease, as well as pests becoming resistant to the original level of pesticides being used to tackle the problem.

This increasing use of pesticides has placed an increasing financial burden on farmers, but since the micronutrients in the soil are being depleted by the use of chemicals, farmers have begun to see reduced crop yield, resulting in lower incomes. These factors place the farmer under financial strain with less number of legitimate finance lenders, many typically turn on to loan sharks. The inability of

farmers to pay off their loan leads to the tragic act of suicide, with the rate of 47% higher than the overall Indian population.

There has also been weak regulation of the pesticide industry in India, with pesticides that have been banned for health reasons in many other countries are widely available in India. Some chemicals are also available in dangerously high concentration such as '*Organophosphorus*'. *This chemical has been blamed for the deaths of school children (Sat, July 2013, 23 Children Died, 23 children died : Reuters) in Patna*, after high quantities of the chemical were found in the Children's free meals. In Punjab the home of the green revolution scientists have found that village using higher amounts of pesticides are also the ones with the higher rates of cancer. The problem have become so severe that there is now even a "**Cancer train**" which takes citizens from Punjab to the town of Bikaner, where the Government's centre for cancer treatment is located.

Increased use of various techniques such as pesticides, herbicides and fertilizers as well as new breeds of high yield crops were employed in the decades after mid sixties to greatly increase the food production all over India. In 1989 WHO and UNEP estimated that there were around 1 million human pesticide poisoning annually, some 20,000 (mostly in developing countries) ended in death, as a result of poor labeling, poor safety standards etc.

Long exposure to pesticides such as '*Organochlorines, Cresote and Sulfate* have been correlated with higher cancer rates and *Organochlorines, DDT, Chlordane and Lindane as tumor promoters*.

Contradictory, epidemiologic studies in humans have linked *phenoxy acid herbicides or contaminants in them with soft tissue Sarcoma (STS) and Malignant lymphoma, organochlorine insecticides with STS, non-Hodgkin's lymphoma (NHL), leukemia and less consistently with cancers of the lung and breast, organophosphorus compounds with NHL and leukemia and triazine herbicides with ovarian cancer*.

A comprehensive study conducted by Post Graduate Institute of Medical Institution and Research (PGIMER) has underlined the direct relationship between indiscriminate use of these chemicals and increased incidence of cancer in the region of Punjab. A increase in the number of cases has been reported in several villages of Punjab including *Jhariwala, Kohar wala, Puckka, Bhimawali and Khara*.

In 2009, under a green peace Research Laboratories investigation Dr. Reyes Tirado, from the University of Exeter, UK conducted the study in 50 villages in Muktsar, Bathinda and Ludhiana districts and revealed chemical radiation and biological toxicity rampant in Punjab. 20% of the sampled wells showed nitrate levels above the safety limit of 50 mg/l established by WHO the study connected it with high use of *synthetic nitrogen fertilizers*. With increasing poisoning of the soil, the region once hailed as the home of green revolution now being termed as 'other Bhopal' due to excessive use of chemical fertilizers.

In order to obtain food security we have stressed on achieving the first two conditions of Food security while the third condition of absorption of food to lead active and healthy life is endangered due to certain tragic long term outcome.

## CONCLUSION:

The post Green Revolution period saw a drop in investment in agriculture dropped dramatically, however the need for continued investments in agricultural innovation and productivity growth is as important today as it was in the early years of the Green Revolution.

The Green revolution in the process of tackling the problem of hunger took a step of multiplying productivity through chemical fertilizers and these gains of green revolution came at a high price of sacrificing the health in return.

The solution now is the realization and return towards organic farming set up. In 2003, Sikkim became the first state in India to pass a resolution in the state assembly to convert all food sources in the state to organic agriculture by 2015. Subsidies were shifted away from chemical fertilizers, towards composting systems. Within Sikkim farmer field schools are being organized to provide farmers with practical training on sustainable methods of farming. Organic farmers in Sikkim have begun to achieve a higher quantity of crop as well as a better quality, and these results are proving an attractive draw for non organic farmers to make the switch. This success has been aided by the high level of support received from the Sikkim Government. The success of southern states in India which has already moved towards the organic farming set up also inspires the other states in India to opt for a solution of food security without sacrificing the nutritional security in the country.

The success of southern state in India that have already moved towards organic farming has begun to inspire Punjabi farmers to move away from chemical inputs.

The same realization is needed on a countrywide basis not only to ensure the health of soil but also the health of human being and to practice the sustainable agriculture on long term scenario.

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